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10/026,477	12/27/2001	Hong Suk Yoo	8733.561.00	7762
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MCKENNA LONG & ALDRIDGE LLP			RUDE, TIMOTHY L	
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WASHINGTON, DC 20006			PAPER NUMBER	
			2883	

DATE MAILED: 04/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/026,477

Applicant(s)

YOO ET AL.

Examiner

Timothy L. Rude

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 January 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-5 and 15-25 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 3-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon.

As to claim 15, Moon discloses in the 5<sup>th</sup> embodiment (col. 6, lines 8-63 and Figures 8A-8D) a liquid crystal display (LCD) device comprising:

- a first substrate , 100; a second substrate;
- a liquid crystal layer formed between the first and second substrates;
- a storage capacitor, (combination of 4, 6, 1, 2, and unlabeled 9; col. 6, lines 10-30), formed in a first region of the first substrate;
- a thin film transistor formed in a second region of the first substrate.
- a gate electrode, 3, for the thin film transistor and a storage capacitor electrode, 4, spaced apart from the gate electrode, both formed on the first substrate;
- a first insulating layer, 5, formed on the overall surface [col. 4, lines 1-13] of the first substrate [Applicant's formed on an entire surface of the first substrate];

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a second insulating layer, 6, formed on the first insulating layer and the storage capacitor electrode;

a conductive layer (unlabeled layer between layers 2 and 10 above 4) formed on the second insulating layer overlapping the storage capacitor electrode in the first region; and

a pixel electrode (not shown, inherent to comprise functional device) electrically connected to the conductive layer and a drain electrode, 9, on the thin film transistor.

Moon does not explicitly disclose removing a first insulating layer, 5, formed on an entire surface of the first substrate exclusively from an upper portion of the storage capacitor electrode. However, the teachings of Moon are considered to render the claimed invention obvious to those having ordinary skill in the art of liquid crystals, since there is no disclosed functional significance to the minor structural difference as claimed in either Moon or Applicant's enabling disclosure.

In considering the disclosure of a reference it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (MPEP 2144.01).

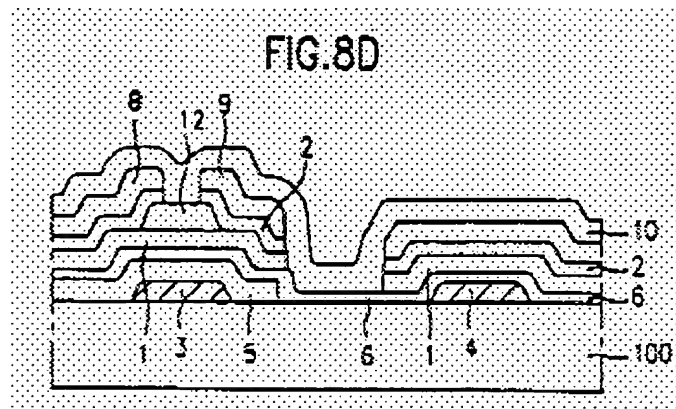
Furthermore, election of species should not be required if the species claimed are considered clearly unpatentable (obvious) over each other (MPEP 808.01(a)). Applicant's specification teaches removal of the first insulating layer from above the capacitor electrode, but it does not explicitly teach retention of the first insulating layer everywhere else. Applicant has merely indicated removal of the first insulating layer from above the capacitor electrode is required to comprise the claimed invention (as

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does Moon), so alternate species wherein the first insulating layer is retained or eliminated from other regions are considered clearly unpatentable (obvious) over each other since they are not explicitly precluded by Applicant's specification and since there is no teaching as to the significance of one over the other in either Moon or Applicant's enabling disclosure. Both Applicant and the applied prior art, Moon, teach the same advantage of a thinned insulator above the capacitor electrode and any subtle species variation(s) are considered obvious species variations that are unpatentable over each other (MPEP 808.01(a)).

Moon is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to remove the first insulating layer from the capacitor electrode to facilitate formation of a capacitor with increased capacity and thereby allow the improvement of aperture ratio [col. 4, lines 14-30].

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Moon with the removal of the first insulating layer from the capacitor electrode (exclusively or in conjunction with removal from other areas, e.g., pixel area) to facilitate formation of a capacitor with increased capacity and thereby allow the improvement of aperture ratio.



As to claim 16, Moon discloses the device above.

Moon does not explicitly disclose a device wherein the gate insulating layer of the first region, 6 (Applicant's second insulating layer), has a thickness in a range of about  $100\text{\AA}$ ~ $4000\text{\AA}$ .

Moon teaches the purpose of removing the first insulating layer (Applicant's thinner insulating layer in the first region) is to increase the value of capacitance to allow increased viewing angle (Title and col. 6, lines 30-40) which constitutes a results effective variable.

Moon is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to reduce the gate insulating layer thickness of the first region to a thickness in a range of about  $100\text{\AA}$ ~ $4000\text{\AA}$  to increase the value of capacitance to allow increased viewing angle.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Moon with the

reduced gate insulating layer thickness of the first region to a range of about 100Å~4000Å to increase the value of capacitance to allow increased viewing angle.

As to claim 17, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 15, further comprising a semiconductor layer, 1, formed above the second insulating layer in the second region and used as a channel of the thin film transistor.

As to claim 18, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 17, further comprising a source electrode, 8, and a drain electrode, 9, opposing each other and formed above the semiconductor layer.

As to claim 19, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 18, wherein the conductive layer (unlabeled 9 between 2 and 10) is of the same material as the source and drain electrodes and formed on the second insulating layer in the first region.

As to claim 20, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 18, further comprising an ohmic contact layer, 2, formed at an interface between the source and drain electrodes and the semiconductor layer.

As to claim 21, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 18, further comprising a passivation layer, 10, having a contact hole and formed on an entire surface including the conductive layer and the source and drain electrodes to expose upper portions of the drain electrode and the conductive layer.

As to claim 22, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 21, wherein the pixel electrode electrically connects to the drain electrode and the conductive layer through the contact hole (inherent to a functional device and obvious to those having ordinary skill in the art given the other embodiments of Moon).

2. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon, as applied to claims above, in view of Hwang USPAT 6,545,730 B1.

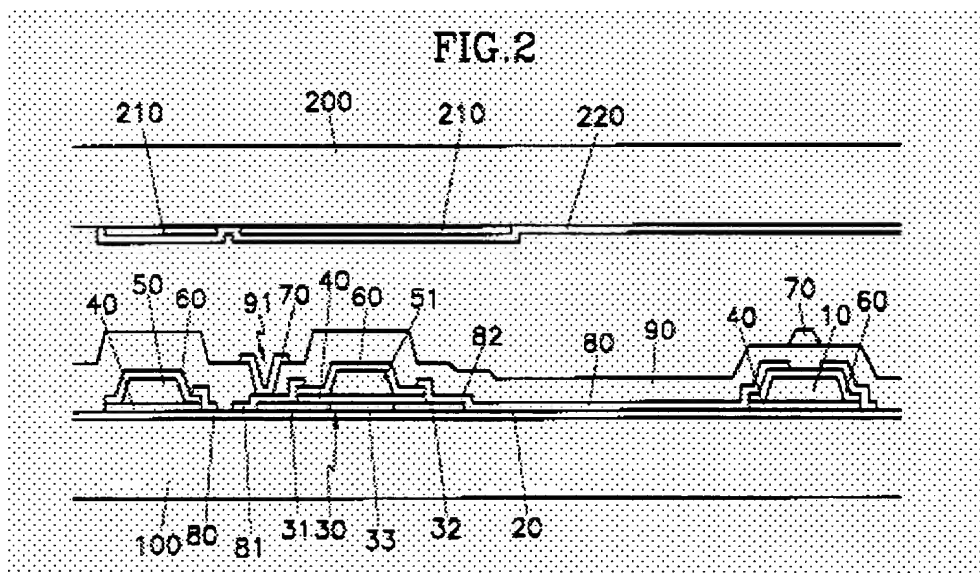
As to claims 23-25, Moon discloses the LCD device as claimed in claim 15.

Moon does not explicitly disclose a device wherein the second substrate further includes: a plurality of Red (R), green (G), and blue (B) color filter patterns formed on the second substrate opposite to the first substrate for displaying colors; a black matrix for dividing the respective color filter patterns and for shielding light; and a common electrode for applying a voltage to the liquid crystal layer, however this is well known in the art.



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For example, Hwang teaches in the background of the invention, and in the first preferred embodiment, a second substrate, 200, comprising a plurality of Red (R), green (G), and blue (B) color filter patterns (col. 1, lines 26-33 and col. 2, lines 22-28; and Figure 2) for displaying colors; a black matrix, 210, for dividing the respective color filter patterns and for shielding light; and a common electrode, 220, for applying a voltage to the liquid crystal layer formed on the entire surface (col. 3, lines 24-26) including the black matrix and the color filter patterns, to achieve good color display performance with good contrast and good aperture ratio.



Hwang is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a second substrate comprising a plurality of Red (R), green (G), and blue (B) color filter patterns for displaying colors; a black matrix for dividing the respective color filter patterns and for shielding light; and a common

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electrode for applying a voltage to the liquid crystal layer formed on the entire surface including the black matrix and the color filter patterns, to achieve good color display performance with good contrast and good aperture ratio.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Moon with the second substrate comprising a plurality of Red (R), green (G), and blue (B) color filter patterns for displaying colors; a black matrix for dividing the respective color filter patterns and for shielding light; and a common electrode for applying a voltage to the liquid crystal layer formed on the entire surface including the black matrix and the color filter patterns of Hwang to achieve good color display performance with good contrast and good aperture ratio.

References cited but not applied are relevant to the instant Application.

### ***Response to Arguments***

3. Applicant's arguments filed on 13 January 2005 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are as follows:

(1) Regarding claims 15-22, prior art does not teach a first insulating layer formed on an entire surface of the first substrate except an upper portion of the storage capacitor electrode.

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(2) There is no proper motivation to modify Moon.

(3) Claim 15 rests on its claimed structure.

(4) Examiner contradicts himself regarding restriction.

There is a functional difference between Moon and the invention as claimed.

(5) Hwang fails to overcome the deficiencies of Moon.

(6) Dependent claims are allowable for the same reason(s) as the independent claims.

Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that an election of species should not be required if the species claimed are considered clearly unpatentable (obvious) over each other (MPEP 808.01(a)). Applicant's specification teaches motivation for removal of the first insulating layer from above the capacitor electrode, but it does not explicitly teach any motivation for retention of the first insulating layer everywhere else. Applicant has merely indicated removal of the first insulating layer from above the capacitor electrode is required to comprise the claimed invention (as does Moon), so alternate species wherein the first insulating layer is retained or eliminated from other regions are considered clearly unpatentable (obvious) over each other since they are not explicitly precluded by Applicant's specification and since there is no teaching as to the significance of one over the other in either Moon or Applicant's enabling disclosure. Both Applicant and the applied prior art, Moon, teach the same advantage of a thinned insulator above the capacitor electrode and any subtle species variation(s) are considered obvious species variations that are unpatentable over each other (MPEP 808.01(a)) since there is no indication/teaching to the contrary in either Moon or the instant Application. Species variations depending only upon differences in this region where both Applicant and Moon are silent are considered to be not patentably distinct.

In considering the disclosure of a reference it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (MPEP 2144.01). Examiner considers it would have been obvious in view of Moon to remove the gate insulation

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layer from exclusively the capacitor electrode as one of many obvious species variations that would have been apparent to those having ordinary skill in the art at the time the claimed invention was made. Basically, if one of ordinary skill did not need to remove the gate insulation layer from any other region for any reason, one would naturally only remove it from above the capacitor electrode, because it would be the most simple manufacturing solution that requires the least amount of etching.

It is respectfully pointed out that the teachings of Moon are considered to render the claimed invention obvious to those having ordinary skill in the art of liquid crystals, since there is no disclosed functional significance to the minor structural difference as claimed in either Moon or Applicant's enabling disclosure.

(2) It is respectfully pointed out that Moon teaches formation of the gate insulation layer over the entire substrate, and Moon teaches a motivation for removing it from above the capacitor electrode. In considering the disclosure of a reference it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (MPEP 2144.01).

(3) It is respectfully pointed out that Moon teaches formation of the gate insulation layer over the entire substrate, and Moon teaches a motivation for removing it from above the capacitor electrode. In considering the disclosure of a reference it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (MPEP 2144.01).

(4) It is respectfully pointed out that single layer structure is considered patentably distinct from double layered structure because Applicant disclosed them as two distinct embodiments. Had Applicant disclosed multiple embodiments of differing areas of removal of the gate insulation layer for distinct motivations, they would have also been considered patentably distinct. A design detail that has no disclosed motivation for being is generally considered to NOT be the only pivotal reason for patentable distinctness; rather it is considered to be not patentably distinct.

(5) It is respectfully pointed out that Moon is considered to have no deficiencies that need to be overcome by Hwang, per rejections above.

(6) Applicant has not argued rationale for rejection of dependent claims and has thereby acquiesced. Examiner believes to have responded to all Applicant's substantive arguments. Applicant may wish to consider initiating an interview to discuss any possibilities of pursuing amendments drawn to potentially patentably distinct subject matter.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L. Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Monday through Thursday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



tlr

Timothy L Rude  
Examiner  
Art Unit 2883



Frank G. Font  
Supervisory Patent Examiner  
Technology Center 2800